

enhanced visual image sub-assembly **100** of **FIG. 7** or an equivalent sub-assembly. Subassembly **100**, or **100'** or its equivalent is encased in body **162**, and supported by support mechanism **164**.

[0063] Display **160** may be employed in any one of a number of computing applications. As those skilled in the art would appreciate, sub-assembly **100** or **100'** or its equivalent may be employed in other display applications, including but not limited to palm size computing devices, tablet computing devices, laptop computing devices, set-top boxes, media players and so forth.

#### CONCLUSION AND EPILOGUE

[0064] Thus, it can be seen from the above descriptions, a novel tactilely enhanced visual image display sub-assembly and device have been described.

[0065] While the present invention has been described in terms of the foregoing embodiments, those skilled in the art will recognize that the invention is not limited to the embodiments described. The present invention can be practiced with modification and alteration within the spirit and scope of the appended claims. Thus, the description is to be regarded as illustrative instead of restrictive on the present invention.

What is claimed is:

1. A display comprising:

a flexible visual display layer having a viewing side and a back side; and

a tactile display layer disposed adjacent to the flexible visual display layer on said back side of the flexible visual display layer, to facilitate selective tactile pushing against different portions of the flexible visual display from said back side of the flexible visual display layer.

2. The display of claim 1, wherein the flexible visual display layer comprises a plurality of thin film transistors.

3. The display of claim 1, wherein the flexible visual display layer comprises a plurality of plastic transistors.

4. The display of claim 1, wherein the flexible visual display layer having a thickness in the range of 0.1 mm to 1.0 mm.

5. The display of claim 1, wherein the flexible visual display layer comprises a matrix of  $m \times n$  display pixels, and the tactile display layer comprises  $p \times q$  tactile pistons.

6. The display of claim 5, wherein  $m$  and  $n$  are at least  $2 \times$  multiples of  $p$  and  $q$  respectively.

7. The display of claim 5, wherein  $m$  equals  $q$ , and  $n$  equals  $q$ .

8. The display of claim 1, wherein the display further comprises a sensor circuit coupled to the tactile display layer to sense user touching of activated ones of the tactile pistons.

9. The display of claim 1, wherein the display further comprises a transparent touch sensitive layer disposed adjacent to the flexible visual display layer on said viewing side of the flexible visual display layer.

10. The display of claim 9, wherein the tactile display layer comprises a centered effective area, and the transparent touch sensitive layer has a hollowed effective area surrounding the centered effective area of the tactile display layer.

11. The display of claim 10, wherein the transparent touch sensitive layer comprises a first and a second sub-layer,

where the sub-layers are spaced, flexible and having facing inside surfaces coated with conductive materials.

12. The display of claim 11, wherein the facing inside surface of the first sub-layer is partially coated in a hollowed manner.

13. The display of claim 10, wherein

the transparent touch sensitive layer has a nominal effective touch sensitive area of size  $A_1$ , and the tactile display layer has an effective area of size  $A_2$ , where  $A_1$  is greater than  $A_2$ ; and

the display further comprises a limiting circuit to limit the effective touch sensitive area of the transparent touch sensitive layer to the perimeter area surrounding the effective area of the tactile display layer.

14. The display of claim 9, wherein the transparent touch sensitive layer is capacitance based.

15. A display comprising:

a transparent touch sensitive layer having a touching side and a back side, and a hollowed effective area;

a flexible visual display layer having a viewing side and a back side, disposed adjacent to the transparent touch sensitive layer on the back side of the transparent touch sensitive layer;

a tactile display layer having tactile pistons, disposed adjacent the flexible visual display layer on the back side of the flexible visual display layer, to facilitate selective tactile pushing against different portions of the flexible visual display, the tactile display layer having an effective area aligned with the ineffective portion of the transparent touch sensitive layer; and

a sensor circuit coupled to the tactile display layer to sense user touching of activated ones of tactile pistons of the tactile.

16. The display of claim 15, wherein the flexible visual display layer comprises a plurality of thin film transistors.

17. The display of claim 15, wherein the flexible visual display layer comprises a plurality of plastic transistors.

18. The display of claim 15, wherein the flexible visual display layer having a thickness in the range of 0.1 mm to 1.0 mm.

19. The display of claim 15, wherein the flexible visual display layer comprises a matrix of  $m \times n$  display pixels, and the tactile display layer comprises  $p \times q$  tactile pistons.

20. The display of claim 19, wherein  $m$  and  $n$  are at least  $2 \times$  multiples of  $p$  and  $q$  respectively.

21. The display of claim 19, wherein  $m$  equals  $q$ , and  $n$  equals  $q$ .

22. The display of claim 15, wherein the transparent touch sensitive layer comprises a first and a second sub-layer, where the sub-layers are spaced, flexible and having facing inside surfaces coated with conductive materials.

23. The display of claim 22, wherein the facing inside surface of the first sub-layer is partially coated in a hollowed manner.

24. The display of claim 22, wherein

the transparent touch sensitive layer has a nominal effective touch sensitive area of size  $A_1$ , and the tactile display layer has an effective area of size  $A_2$ , where  $A_1$  is greater than  $A_2$ ; and